Boundary-layer height in a rural/coastal area determined by a ceilometer

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Boundary-layer height in a rural/coastal area determined by a ceilometer

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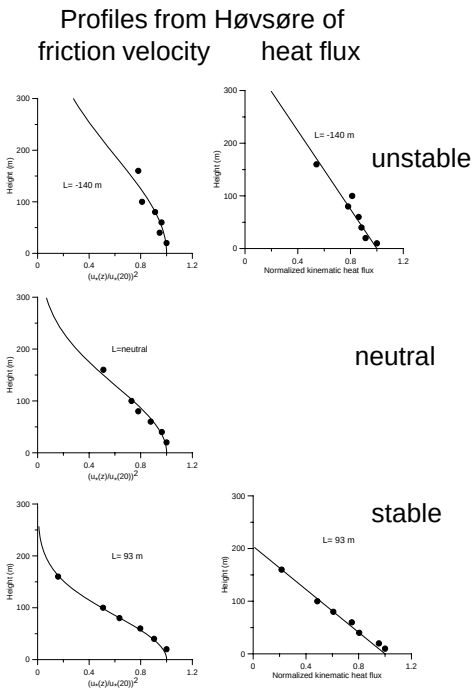
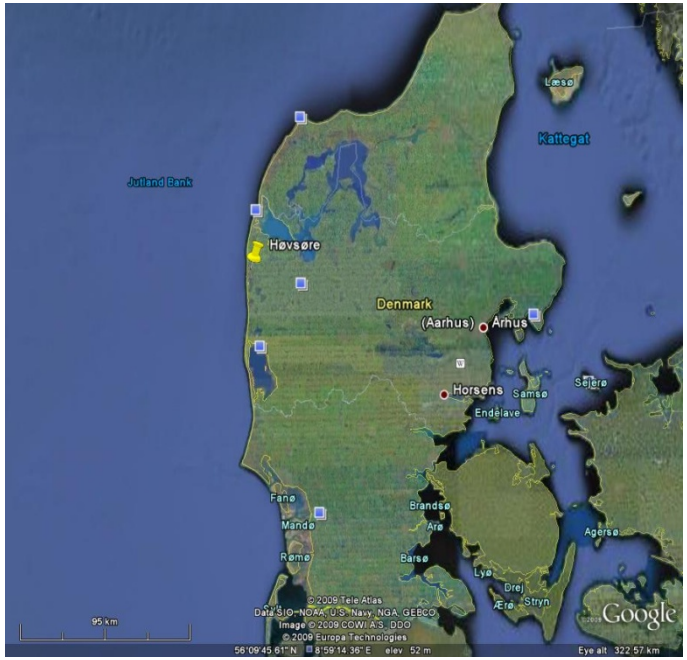


Maybe remote sensing can be used to measure the height of the boundary layer.

For more than two months we have a Leosphere ASL 300 aerosol-lidar and a Vaisala Ceilometer running at the Risø site, the idea with this presentation was to compare the performance of the two instruments.

However we have not yet been able to read the raw data from the Leosphere aerosol lidar and therefore is unable to perform the analysis.

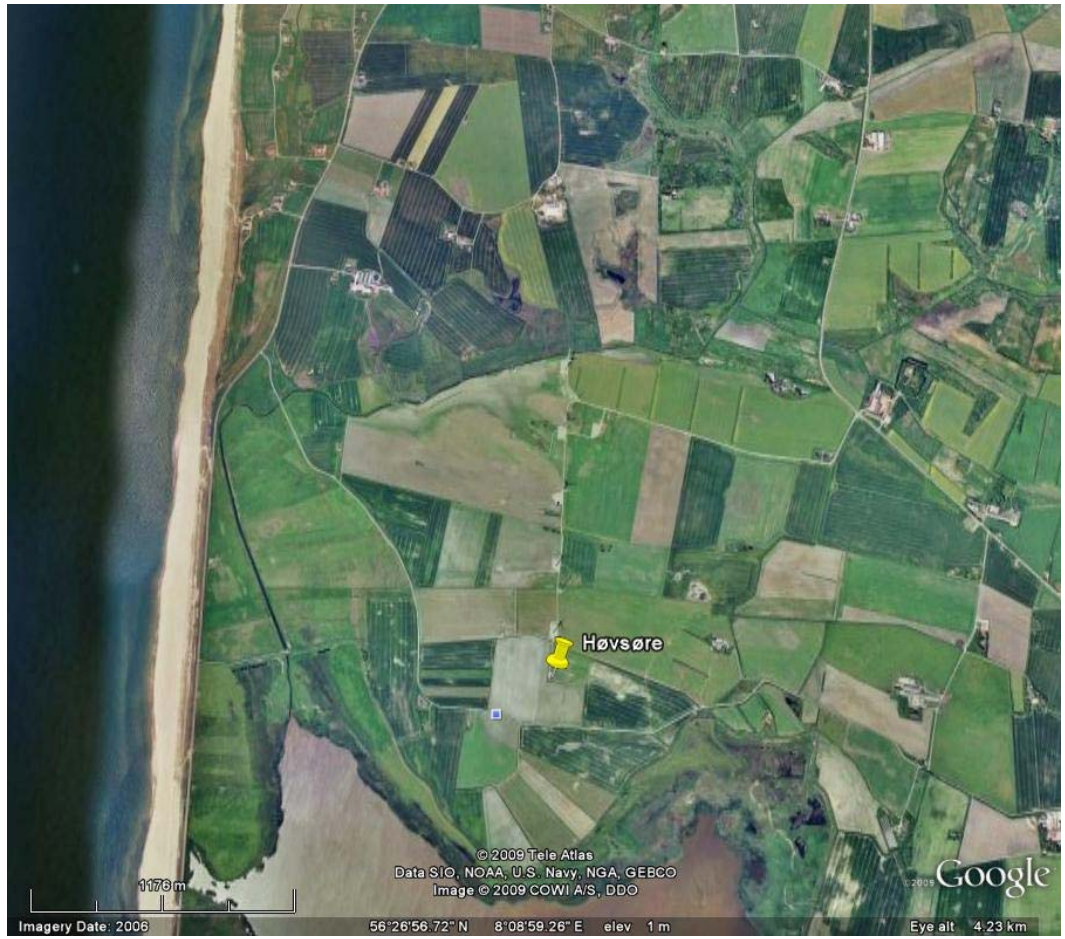
I therefore will shown an example of the use of the Vaisala ceilometer for determination of the boundary-layer height in a coastal/rural area, which I consider also will be of interest for the audience.



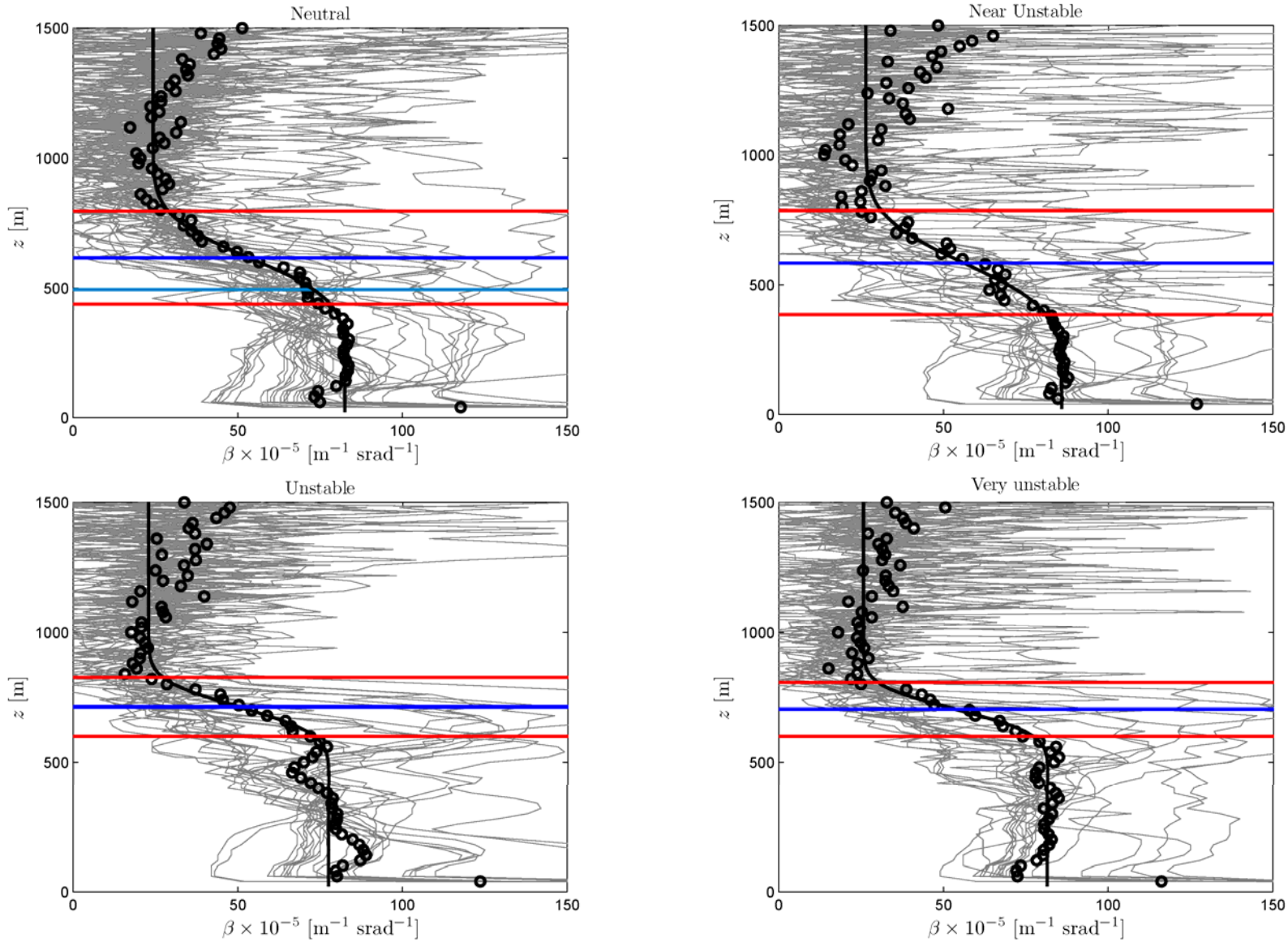
The Høvsøre site

Position of the meteorological mast

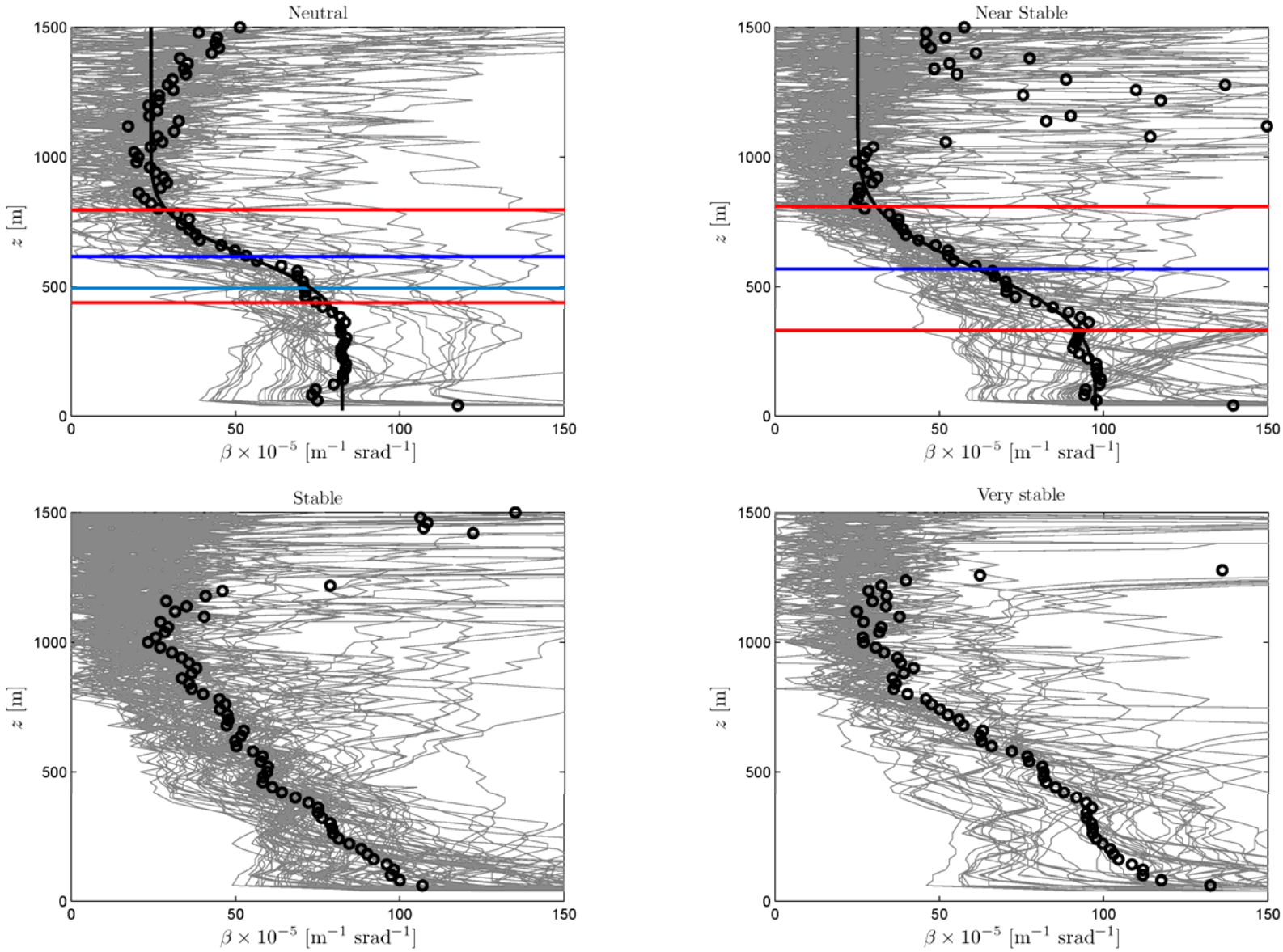
and the ceilometer



Easterly wind neutral to unstable



Easterly wind neutal to stable



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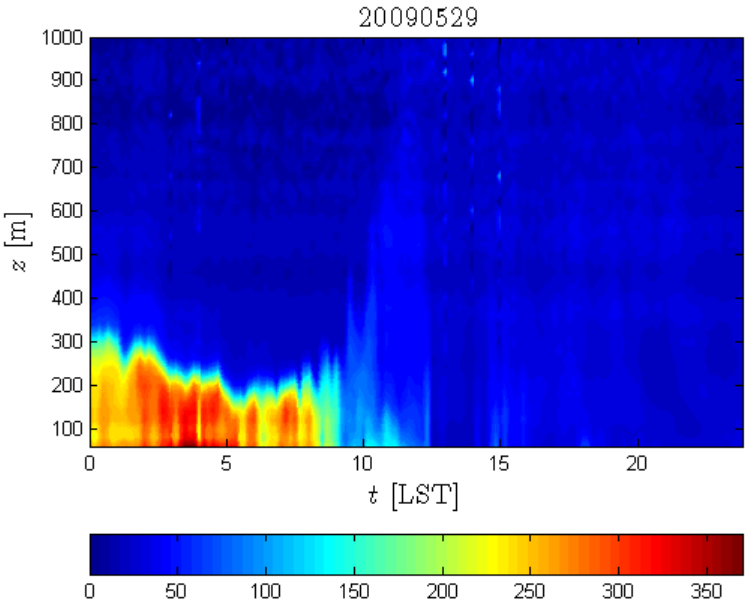
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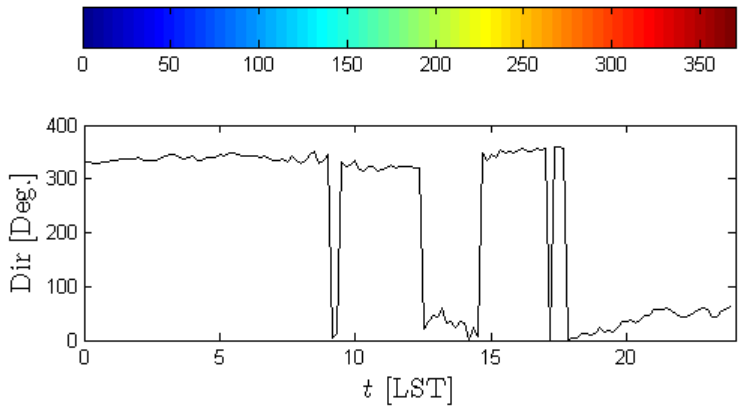
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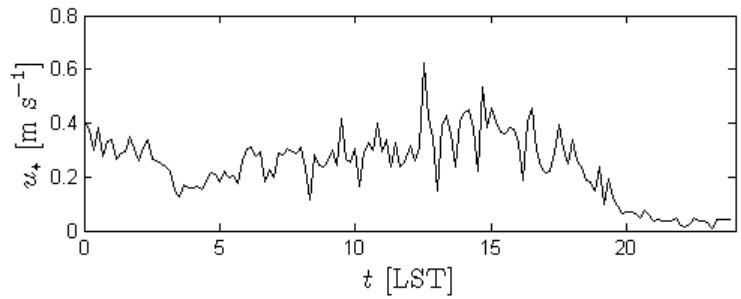
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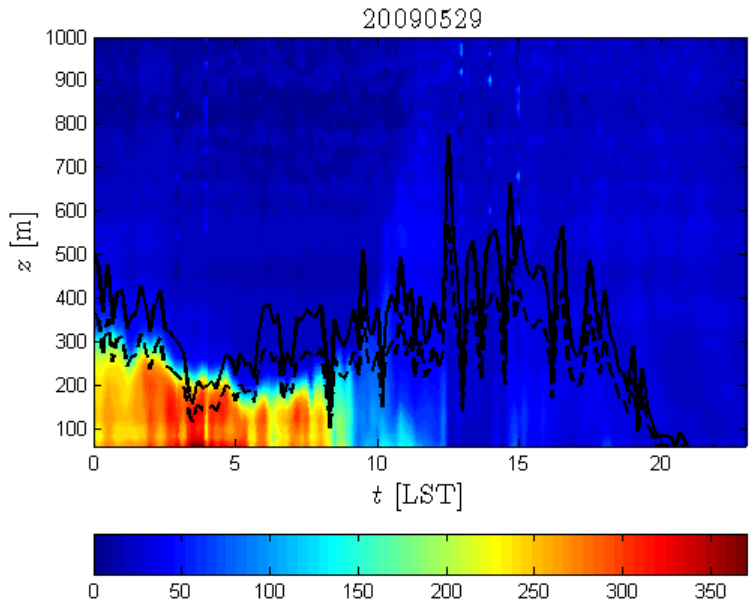
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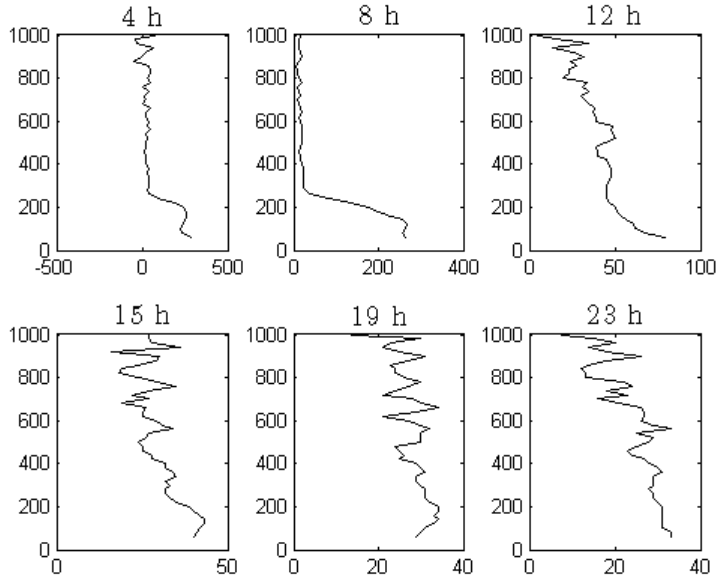
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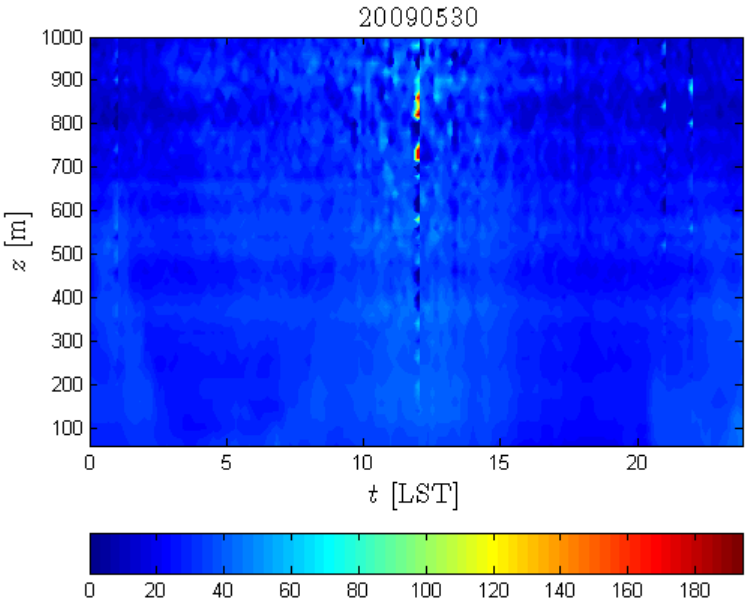
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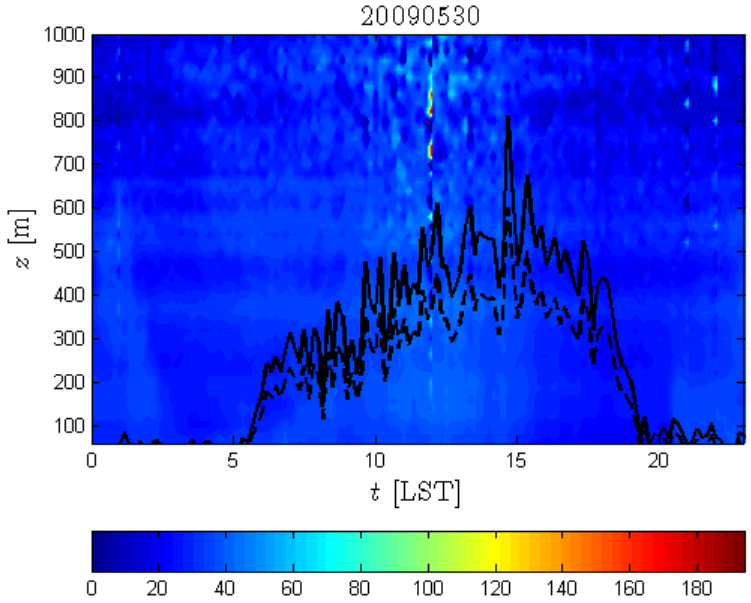
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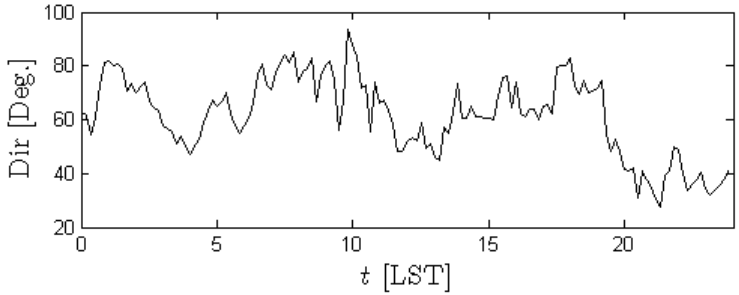
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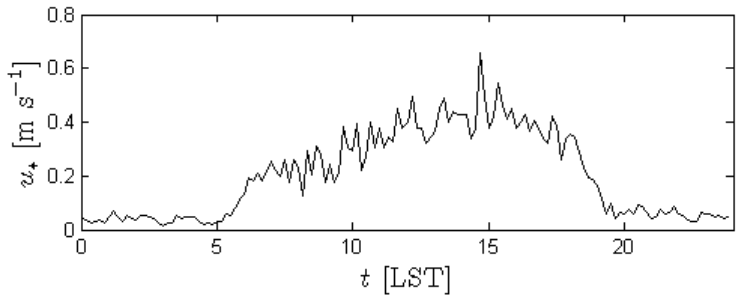
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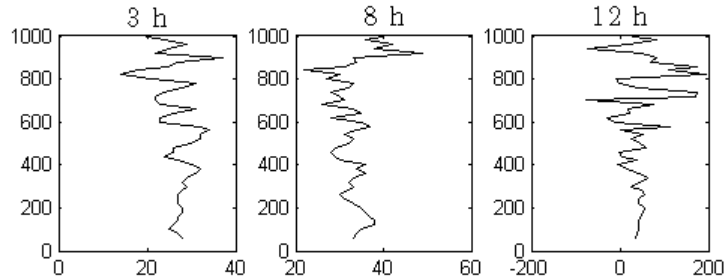
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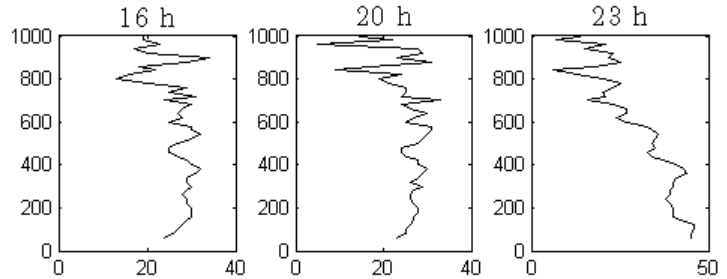
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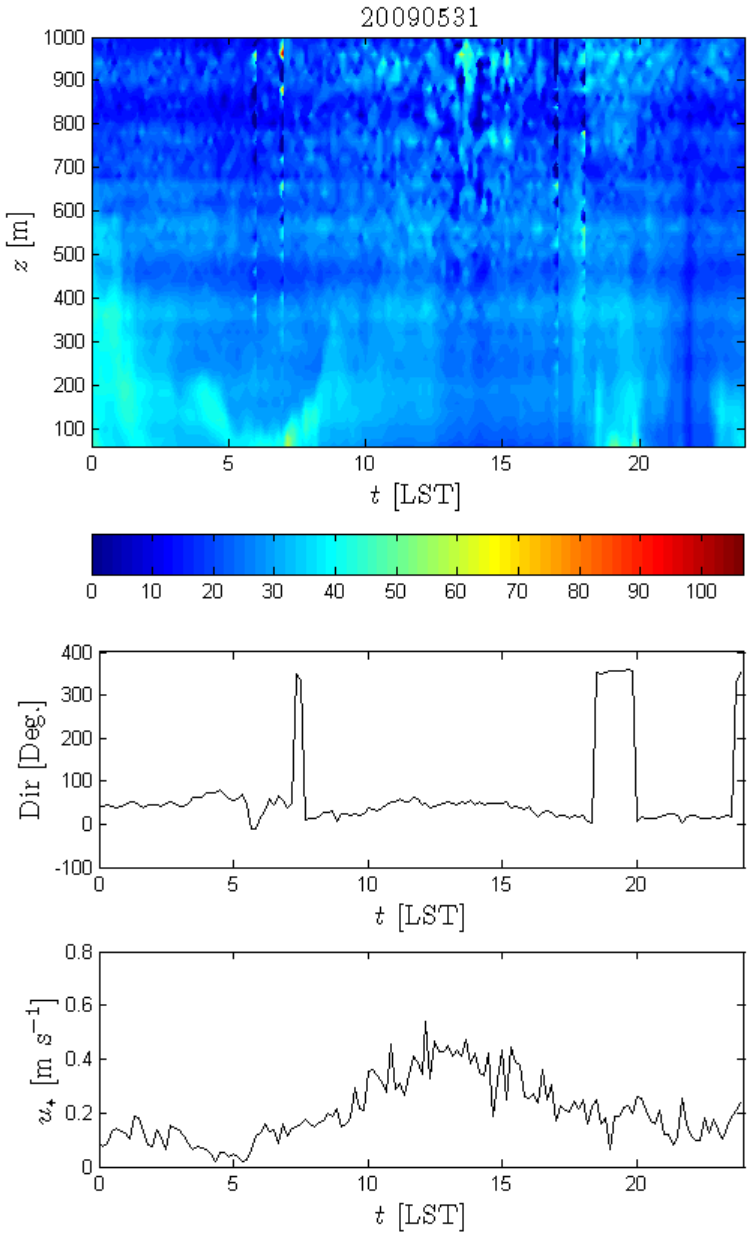

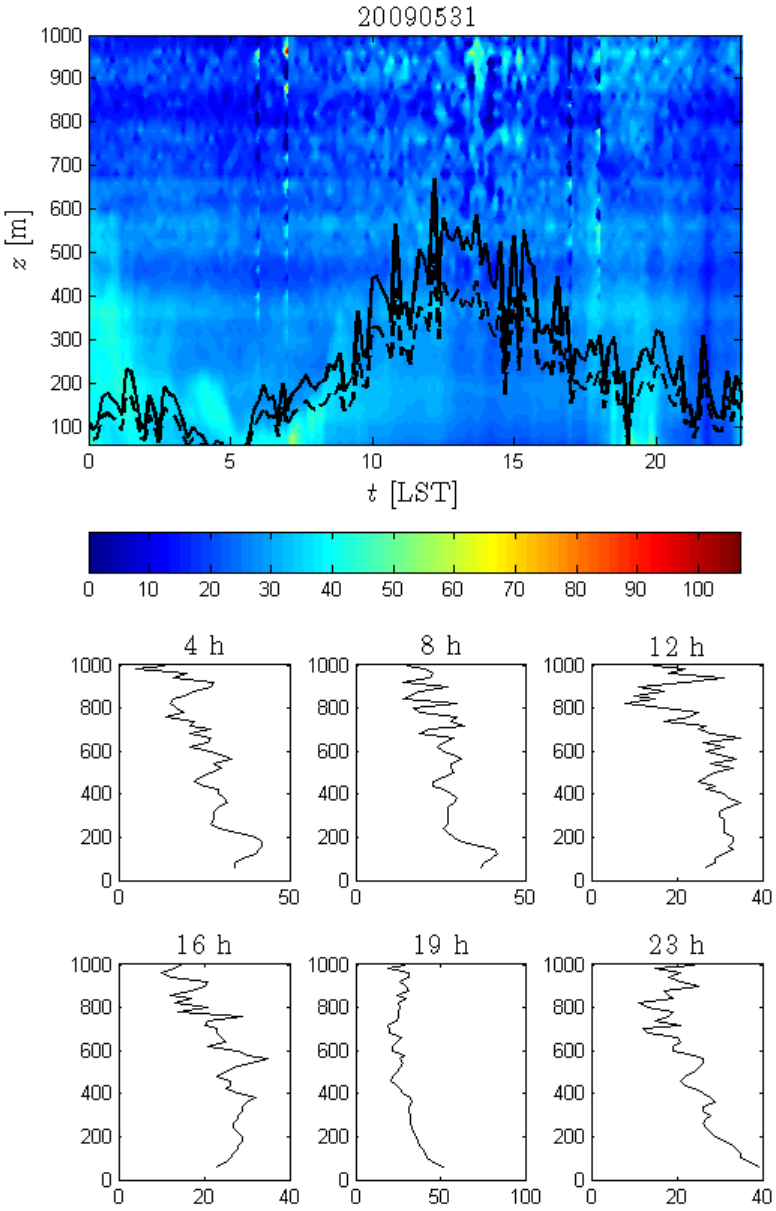

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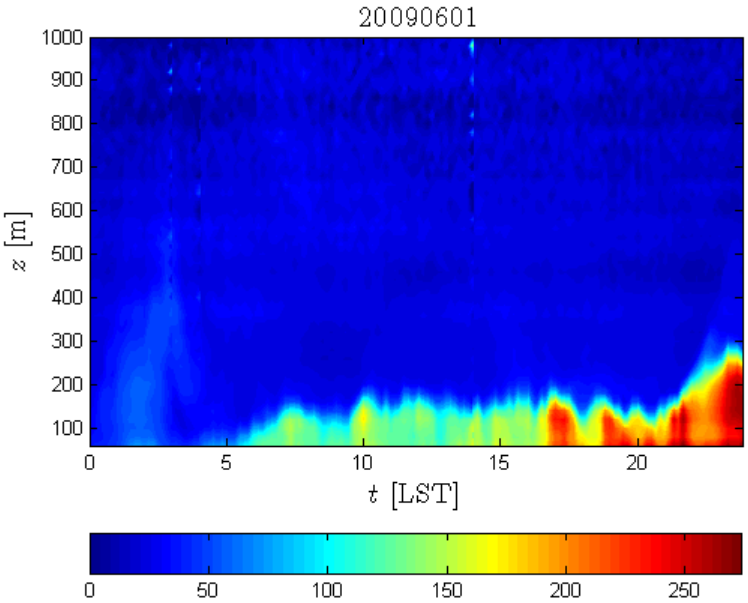
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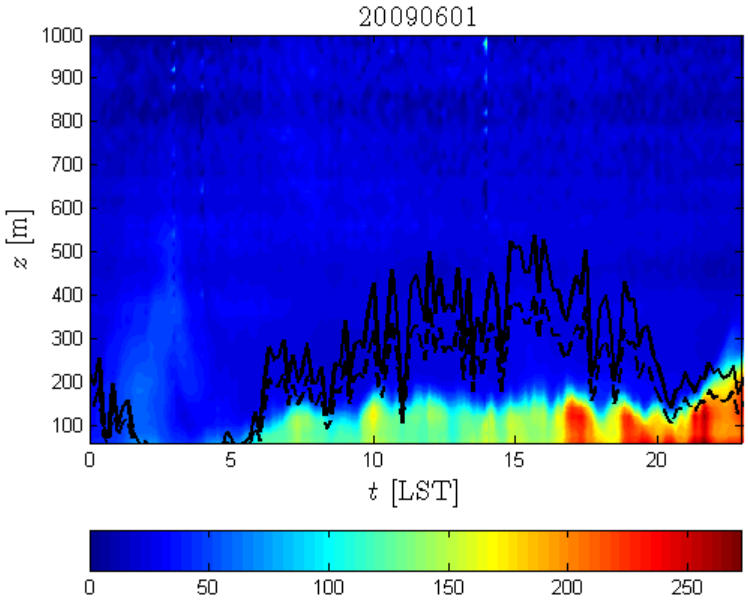
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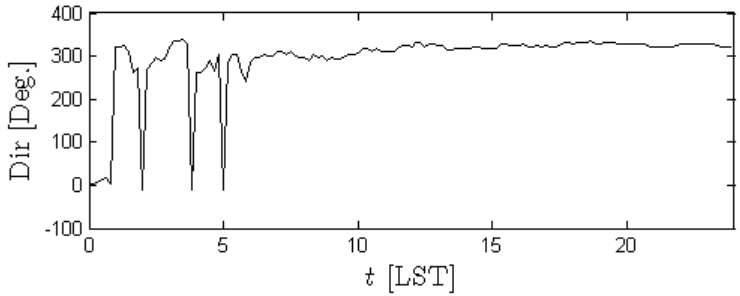
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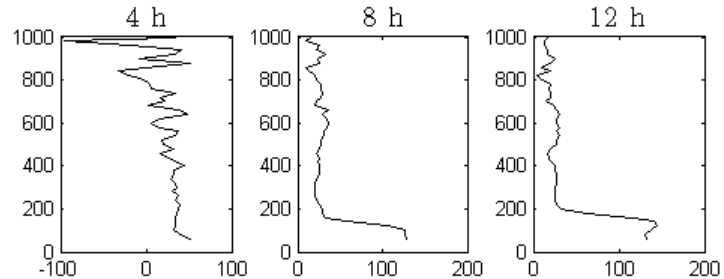
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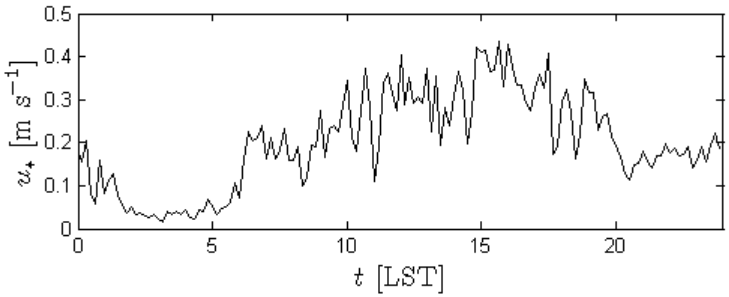
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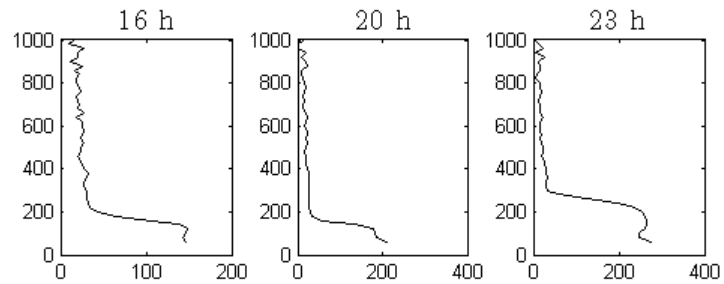
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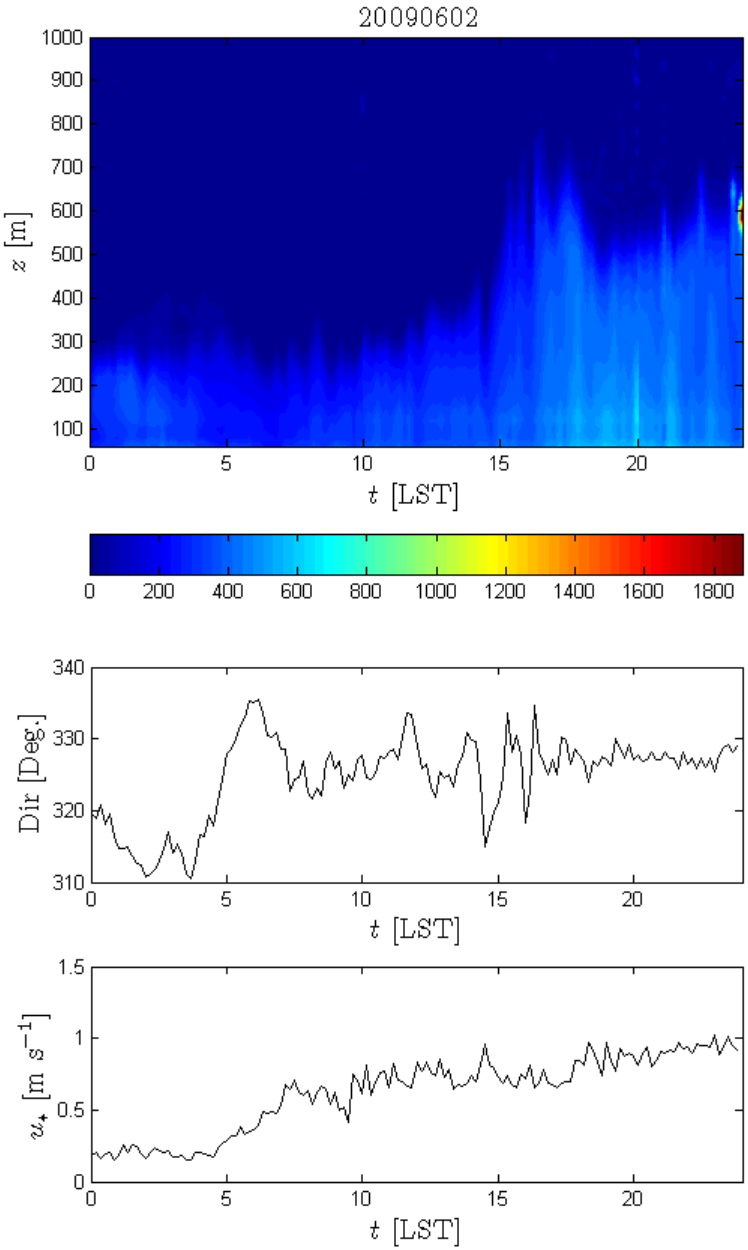
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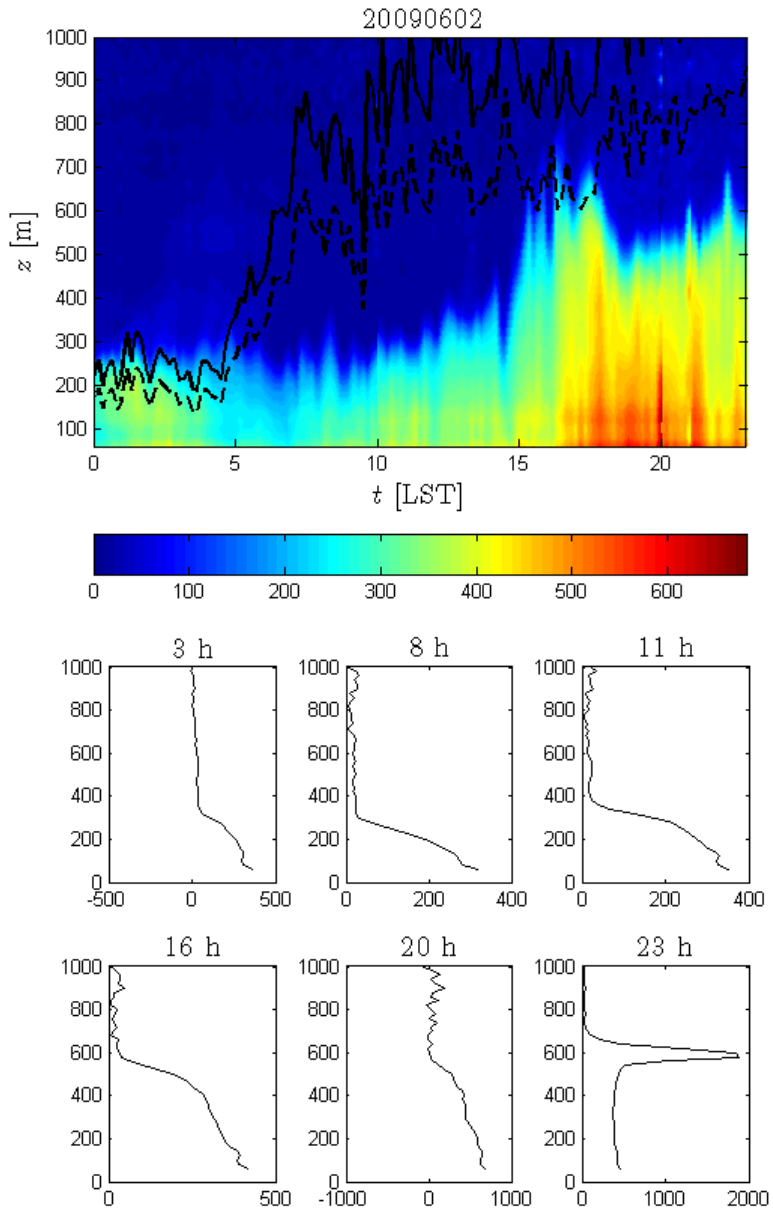
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Conclusions

1.The determination of the bl height is easier for flow from the sea, due to the high concentration of marine aerosols

2.Slightly stable, neutral to unstable conditions. For easterly flows, the individual profiles exerted a large scatter but in the mean the expected structure was found.

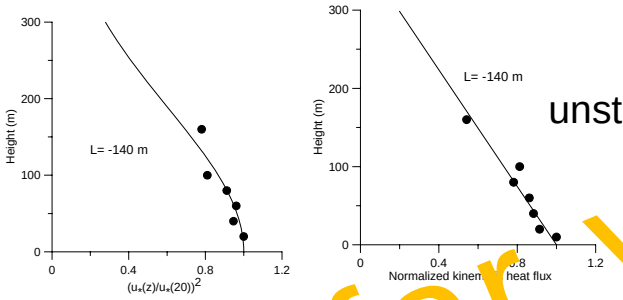
3.For stable conditions it is not obvious how to determine the bl height.

4.Clouds might be a difficulty for automatic monitoring of bl heights by use of ceilometers and aerosol lidars.

5.Not shown here is that from observations of the Leosphere aerosol lidar backscatter profile, the height of the bl in daytime conditions over land (Risø site) was often very easy to determine, but this point needs to be further investigated before firm conclusions can be drawn.

Profiles from Høvsøre of

friction velocity heat flux



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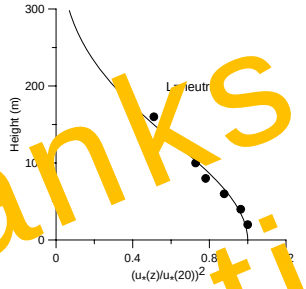
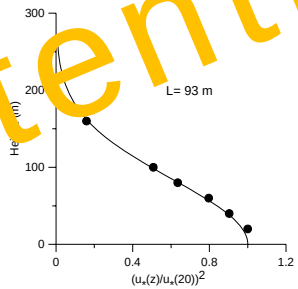
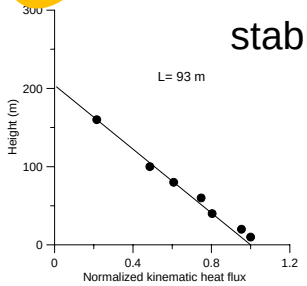


neutral





stable

Thanks for your attention

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